

Law of Sines

• used for AAS, ASS, ASA situations

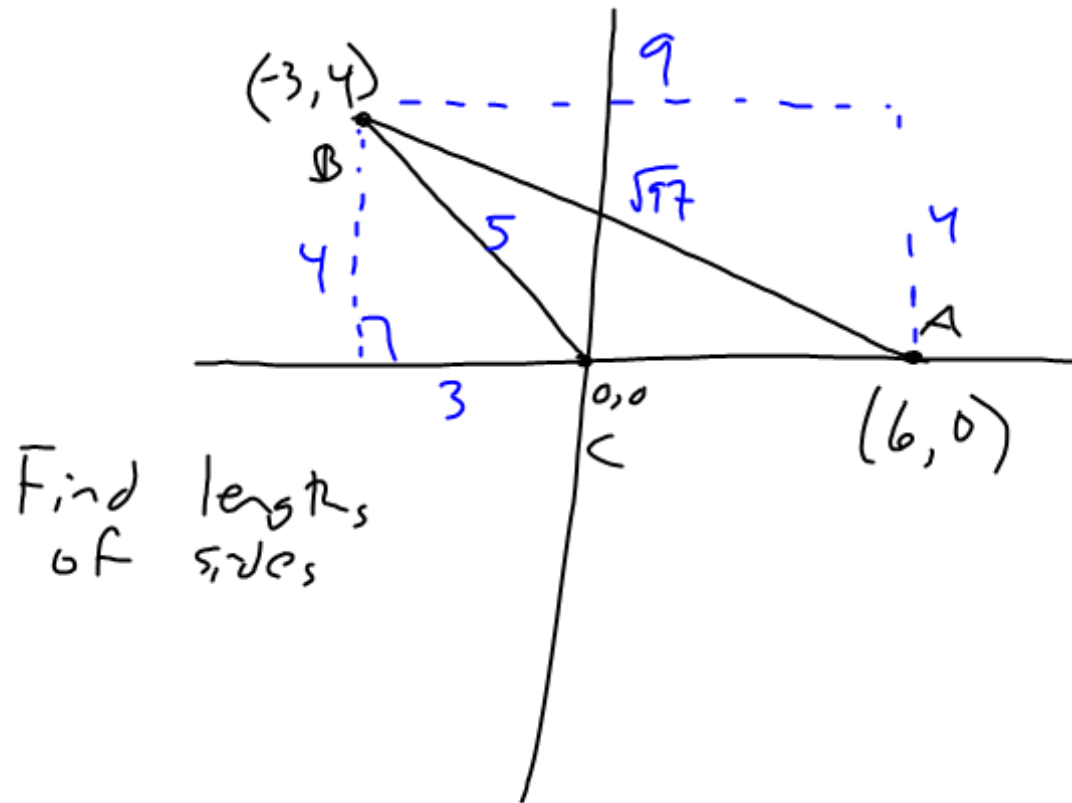
$$\cdot \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

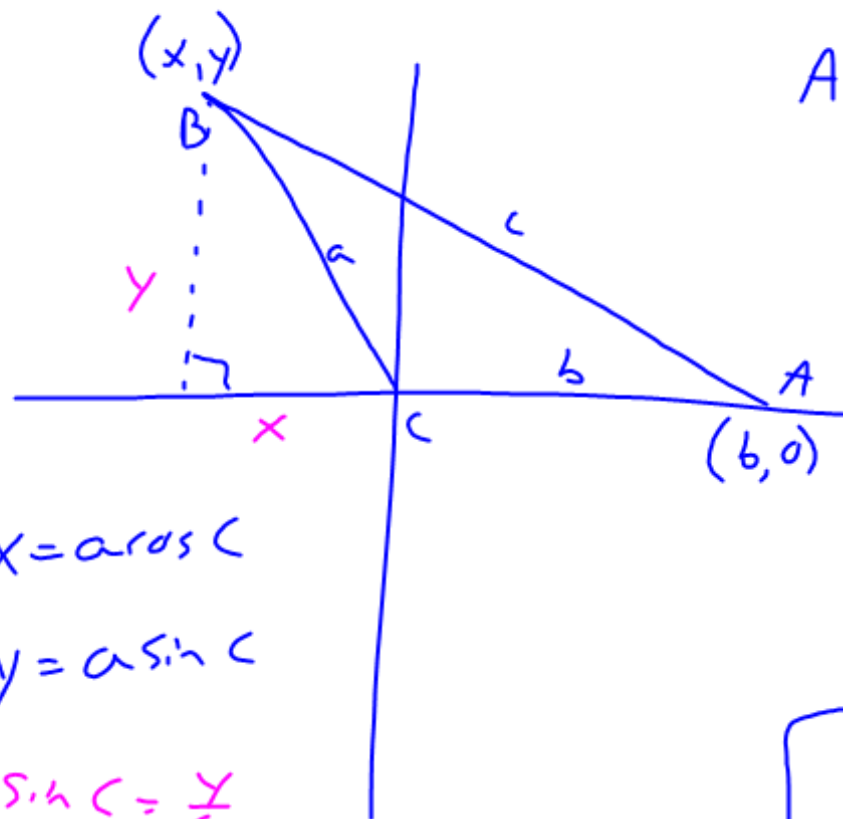
$$\cdot \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Law of Cosines

- Works for SAS & SSS situations
- $c^2 = a^2 + b^2 - 2ab \cos C$
- $a^2 = b^2 + c^2 - 2bc \cos A$
- $b^2 = a^2 + c^2 - 2ac \cos B$

$$AB = \sqrt{(-3-6)^2 + (4-0)^2}$$





$$x = a \cos C$$

$$y = a \sin C$$

$$\sin C = \frac{y}{a}$$

$$\cos C = \frac{x}{a}$$

$$AB = \sqrt{(x-b)^2 + (y-0)^2}$$

$$AB^2 = (a \cos C - b)^2 + (a \sin C)^2$$

$(a \cos C - b)(a \cos C - b)$

$$AB^2 = \underline{a^2 \cos^2 C} - 2ab \cos C + b^2 + \underline{a^2 \sin^2 C}$$

$$\underline{AB^2} = a^2 (\underline{\cos^2 C + \sin^2 C}) + b^2 - 2ab \cos C$$

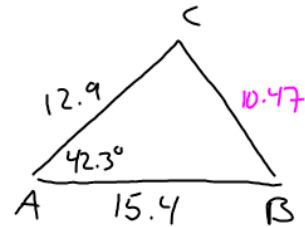
$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

Solve Triangles

② $A = 42.3^\circ$, $b = 12.9$, $c = 15.4$



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 12.9^2 + 15.4^2 - 2(12.9)(15.4) \cos 42.3^\circ$$

$$a^2 \approx 109.7$$

$$a \approx 10.47$$

$$C = 180 - 42.3 - 56 = 81.7$$

Now find an angle

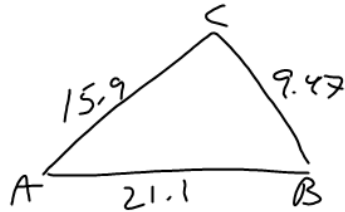
$$\frac{\sin 42.3}{10.47} = \frac{\sin B}{12.9}$$

$$\sin B = 12.9 \left(\frac{\sin 42.3}{10.47} \right)$$

$$B = \sin^{-1} \left(12.9 \frac{\sin 42.3}{10.47} \right)$$

$$B = 56$$

⑥ $a = 9.47$, $b = 15.9$, $c = 21.1$



$$9.47^2 = 15.9^2 + 21.1^2 - 2(15.9)(21.1) \cos A$$

$$-15.9^2 \quad -21.1^2$$

$$9.47^2 - 15.9^2 - 21.1^2 = -2(15.9)(21.1) \cos A$$

$$\frac{-608.3391}{-670.98} = \frac{-670.98 \cos A}{-670.98}$$

$$+0.9066 = \cos A$$

$$A = \cos^{-1}(0.9066)$$

$$A = 24.96$$

HW

- Sect. 7.3 # 1-7, 13-16, 40, 41, 49, 51, 52, 56

↓
see
p. 296

- Write up for drop time and cart due Mon.

- Correct Equations with everything defined (2pts each)

- Why are we starting with the equation

$$h(t) = -16t^2 + S_0$$
 and what do those variables mean (1pt)

- How and why are we substituting for S_0 and t in the drop time and cart equations? (3pts)

- How can you check your equations? (2pts)